NURSING STUDENTS PERCEIVED KNOWLEDGE, ATTITUDES AND PRACTICES CONCERNING OCULAR COMPLICATIONS OF DIABETES

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Abstract: The purpose of the study was to assess the perceived knowledge, attitude and practice of the final year nursing students of King Faisal University Nursing College towards diabetic ocular disease. A cross sectional survey was conducted. The student population was the final year students of nursing students. The data were collected by means of filling up of pre-tested specially designed questionnaires focused on knowledge, attitude and practice towards diabetic ocular disease. The answers were scored by assigning marks. A SPSS 21 was used for statistical analysis.

The knowledge score of thirty seven percent of the nursing students was in the excellent range while about 47% were in the satisfactory range and 16% were in poor range. The attitude score of more than forty percent, fifty percent and eight percent of the nursing students were in the excellent, satisfactory and poor range respectively. The practice knowledge score of thirty two nursing students was in the excellent range while 24% and 43% were in the satisfactory and poor range respectively. The KAP score of nursing students from the urban back ground was significantly better than that of their rural counterpart which was 45% Vs 33% in the excellent score range (p=.003).The practice knowledge score of the female nurse was significantly higher in the satisfactory and excellent range (32.26 % vs.24.19%, p= .028). Since the nurses in practice play a crucial role in the prevention of various diseases, this survey identified the need for improvement in their knowledge, attitude and practices for preventing and treating the patients with diabetic ocular diseases.

Key Words: Diabetic Eye Diseases, Nursing Students, Perceived Knowledge, Attitude, Practice

Introduction:

Diabetes Mellitus (DM) is a major global health problem and its magnitude is increasing day by day. According to one estimate, the global prevalence of DM among the all age group is expected to rise from the existing 2.8% to 4.4% in 2030 [1]. In other words the total number of patients with diabetes is projected to rise from 171 million in 2000 to 366 million in 2030 [2].Likewise the prevalence of DM among the Saudi population has been found to be as high as 30% which represents a major clinical and public health problem in Saudi Arabia [3].

Increased prevalence of diabetes is responsible for increased morbidity owing to various micro vascular (retinopathy, nephropathy and neuropathy) and macro vascular (Ischemic heart diseases and peripheral vasculopathy) complications. Ocular complications associated with DM are rapidly emerging as the most common causes of avoidable blindness. Among the ocular complications of DM, the Diabetic Retinopathy (DR) is the leading cause of avoidable blindness followed by cataract and glaucoma. A pooled analysis from population-based studies has found global prevalence of DR to be 34.6% (95% CI 34.5-34.8) [4]. With the increased prevalence of diabetes, the prevalence of DR is also bound to raise further .DR is considered as the most common cause of avoidable blindness among the working age group of the developed nation. DR is also a major public health problem in Saudi Arabia. New data

emerging from various studies demonstrate that blindness due to DR is increasing in Saudi Arabia and so ministry of health has reactivated its prevention of blindness unit [5].Review of literatures published within the past five years have consistently found higher DR prevalence in different parts of Saudi Arabia which ranged between 27.8% to 36.4% [6,7].Duration of diabetes, hypertension, age, hyperlipidemia and smoking are the important risk factors of developing diabetic retinopathy among the diabetic patients [8].

There are plenty of studies which have reported the cost effectiveness of screening for retinopathy. Screening for the detection of diabetic retinopathy has been established as saver of vision at relatively low cost and this cost is many times less than the disability payments provided to people who are blind due to this complication of diabetes. Annual dilated fundus examination is recommended beginning 5 years after the diagnosis of type 1 diabetes mellitus and at the time of diagnosis of type 2 diabetes mellitus [9].

Laser photocoagulation is a proven effective treatment for preserving vision and reducing the risk of vision loss from diabetic retinopathy. Laser photocoagulation reduces the risk of severe vision loss by 60% or more. The study shows that focal laser photocoagulation reduces the risk of vision loss from macular edema by 50% or more. Sometimes laser are used multiple times to treat the retinal lesion [10].

Patients with DM face a 60% greater risk of developing cataracts and they tend to get cataracts at a younger age and have them progress faster[11].Epidemiologic studies have demonstrated that cataracts are the most common cause of visual impairment in older-onset diabetic patient as well [12].A study done in Saudi Arabia has also found cataract to be more common among diabetic patients and estimated 31% (179/578, 95% CI: 27.3–34.7%) of the type 2 diabetic patients had cataract [13]. Acquiring knowledge of early detection of cataract especially in diabetic population, creating awareness among the diabetic population for its correction by very cost effective surgeries is one of the important pillars of the preventive blindness control programme.

The relationship between diabetes and open-angle glaucoma (the most common type of glaucoma), has intrigued researchers for years. Patients with diabetes are twice as likely to develop glaucoma as are non-diabetics (Glaucoma research foundation, 2015). A hospital based study done in India has found a prevalence of glaucoma to be 15.6% (95% CI: 13.1-18.1) among the diabetic patients [14]. However in an other hospital based study in Yemen the researchers have found the prevalence of glaucoma among the diabetic patients to be 8.6% [15]. Most of the times the glaucoma is symptomless and remains un-detected until we screen the cases of diabetes for the intra ocular pressure or until advanced stages. Routine examination of the eyes of diabetes also includes the measurement of intraocular tension and the health of the optic disc to detect glaucoma and to initiate early intervention and prevent the visual loss.

Effective management of ocular complications of diabetes needs multidisciplinary approach and participation of the community, practicing nurses and medical practitioners. Their knowledge- referred as their understanding of ocular complications of diabetes, their attitude- referred as their feelings and any preconceived ideas toward ocular complications of diabetes and their practice- referred as the ways in which they demonstrate their knowledge and attitude through their actions, have very important role in increasing awareness of the blindness prevention and ocular health promotion among the diabetic population.

The importance of nurses with the disease prevention is enormous as they are the members of health care team who spend the longest time with the patients. They also serve as the resource persons for diabetic patients seeking information on the early detection of the complication of diabetes [16]. The knowledge and practice which they acquire during their study and intern practice time play important role to provide accurate and up-to-date information to improve health behaviors and outcomes of patients with diabetes [17,18] . The nurses therefore, must possess the expected knowledge to enable them to care the diabetic patients helping them to achieve quality of life devoid of complications.

At a time when the concept of public health nursing is evolving, the attitude and practice knowledge of the nurses towards the prevention and control of the complications of the diabetes needs to be improved [19]. For the success of community participation and developing an ethnographic model, the nurses must develop disease focused practice and correct attitude during their study period [19].Studies conducted in different parts of the world show inadequate knowledge, attitude, and practice among the nursing staffs about the ocular complications of the diabetes. According to one study conducted in Pakistan, a considerable knowledge gaps were found among trainee residents and nurses pointing towards need of providing additional education to improve the delivery of diabetes care [20]. In a similar study the researchers have found an average to poor knowledge about the care of diabetic patients among the nurses in a large secondary hospital of South Africa [21].

A positive attitude towards the patients with diabetes is necessary for the proper care and the prevention of its complications. There has been growing concerns on the negative attitudes and behaviors among the health professionals and the recognition and correction of such negative attitudes among these trainee health professionals is important for reducing the impact of the diabetic complications. The study shows that health care professionals had lesser judgmental, moralistic attitude toward patient than did the patients themselves [22].Proper practice knowledge of the nurses is necessary for improving the process of care of the patients suffering from diabetes Research shows that enhancement of the role of nurses in diabetes care led to improvements in patient outcomes and the process of care[23].

The practice knowledge of nurses towards the prevention of complications of diabetes plays crucial role in evolving diabetic management programme. In the current patient – centered treatment approach managed by team of healthcare practitioners, the role of practicing nurses is central [24].Study emphasizes on inter-professional collaboration, community participatory strategies, and the importance of local knowledge to address community health problems. Nurses play the core role through their basic and advanced public health nursing practice [25].

Nurses' perceived knowledge, practice knowledge and attitude about the ocular complications of diabetes is essential as it co-relates with better outcomes leading to improved quality of vision and life [26]. To the best of our knowledge, no such study on nursing students regarding ocular complications of diabetes has been conducted in Saudi Arabia.

Materials and Methods:

The King Faisal University College administration and the research committee approved and had given the permission to pursue this study. This was a nursing college based cross sectional descriptive study. All the final year students of king faisal nursing college were the study population for this study. The students of other years were excluded as their clinical knowledge and practice (during internship) are acquired in the final year according to their curriculum. A pilot study was conducted on five nursing students before the start of this study .These five nursing students were later excluded from the study. A written consent was taken from each participant. Open ended and close ended questionnaires were used

to collect the responses. The questionnaire was given to two ophthalmologists in the rank of assistant professor of King Faisal University Medical College and one family physician. They got their validity and reliability checked based on pilot study. The questionnaire was revised accordingly. The questionnaires comprised of ten questions on the knowledge about diabetic ocular complication and ocular care. The design and the types of questions were prepared based on the KAP study guidelines [27]. Five attitude related questions on primary prevention and eye care of diabetic ocular diseases were included. The practice section also included five questions regarding their practice such as DR management, counseling services, intervention and screening towards the eye care of the patients with diabetes mellitus. A five-point Likert scale ranging from 5 strongly agree to 1 strongly disagree was used to score the answer.

The correct responses of each question were determined by the study investigator who is himself the associate professor of ophthalmology in the king faisal university medical school. The correct answer was awarded 5 points while 0 point was awarded for incorrect answer. Awarding 5 points for each question was done to make total score 100 with 20 questions. This was done to make the calculation easy. Combined score marks of knowledge; attitude and practice related questions were regrouped in four categories. Person with 75% to 100% score was considered to have 'excellent' grade of response. If the score was 50% to 74%, it was considered as satisfactory. Persons scoring 25% to 49% and 0% to 24% were grouped into poor and very poor grades respectively. The questionnaires were distributed to the students in the leisure period and collected immediately after completion. Demographic information of the participants regarding the age, sex and residence status was also recorded. The data were entered into the personal computer using SPSS version 21. Descriptive statistics including frequencies, percentages, means and standard deviations were computed. The Fisher's Exact Chi-square (χ^2) test was used in determining statistically significant. A P value of <0.05 was considered as statistically significant.

Result:

A total of sixty two nursing students were distributed the questionnaires with a mean age of 27.10 with standard deviation of 5.12 with a range of 23-45 years. Among them 35 (43.5%) were female while 27 (43.5%) were male. Thirty eight (61.3%) of total study subjects belonged to the urban area while rest were from rural area. As far as the family background is concerned more than fifty percent (N=32) were from medical family background, 24 (38.7%) from non medical and 6 (9.7%) were from uneducated family background [Table 1]

Table 1 Demographic characteristic:

	Number	Percentage
Gender Male Female	 27 35	 43.5 56.5
Mean age	27.10+ 5.12	
Geographic background Rural Urban	 24 38	 38.7 61.3

Knowledge:

More than fifty percent (N=33) of the participants accepted that they did not hear about the diabetic eye diseases. More than 80% (N=51) were correct in saying that retina of the eyes were mainly affected by

the diabetes. At the same time more than fifty percent (53.2%, N= 33) answered wrong in saying that diabetic retinopathy cause symptoms in its early stage. Most of the students (N=50, 81%) agreed that eye doctors should examine the diabetic patients with special instruments to diagnose diabetic eye disease and also that blindness due to diabetes is preventable by early diagnosis and proper intervention. More than sixty percent of the students (N=41) did not know that diabetes is the risk factor of developing glaucoma. However more than seventy two percent (N=45) of the students agreed that diabetes can cause cataract in young age. When asked about the risk factors of developing diabetic retinopathy, 80.7% (N= 50) of the nurses were correct in saying that duration and hypertension are directly related to the progression of diabetic retinopathy but the reverse was true when they were asked that smoking is an important determinant of progression of diabetic retinopathy and only twenty six students (41.9%) answered correctly. The details of the responses in shown in the table 2

Table 2 Showing Responses of Knowledge questionnaires

Questionires	Response				
Have you ever heard about diabetic eye disease? Yes No	 29 (46.8%) 33 (53.2%)				
Which part of the eyes are mainly affected by diabetes Conjunctiva Cornea Lens Reina	 3 (4.8%) 1 (1.6%) 7 (11.3%) 51 (82.3%)				
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Diabetic retinopathy can cause symptoms in its early stage.	5 (8.06%)	28(45.2%)	9(14.5%)	17(27.42%)	3(4.8%)
Eye doctor will examine eye using special equipment to find effect of diabetes	16(25.8%)	34(54.8%)	2(3.2%)	10(10.1%)	0
Blindness due to diabetes is preventable by early diagnosis and proper treatment	18(29%)	37(59.7%)	4(6.5%)	3(4.8%)	0
Control of blood sugar and lipids makes treatment effective	27(43.5%)	34(54.8%)	1(1.8%)	0	0
Diabetes is a risk factor for developing glaucoma	17(27.4%)	4(6.5%)	3(4.8%)	38(61.3%)	0
Diabetes can cause Cataract in young age	3(4.8%)	42(67.7%)	6(9.7%)	11(17.7%)	0
Duration and hypertension is directly related to the progression of diabetic retinopathy	5(8.1%)	45(72 .6%)	6(9.7%)	6(9.7%)	
Smoking is an important determinant of progression of diabetic retinopathy among the diabetic patients	9(14.5%)	31(50.0%)	17(27.4%)	5(8.1%)	0

Attitude:

Almost all students (N=59) disagreed with the statement that the diabetic patients do not need eye examination if she/he has no symptom and more than sixty percent (N=41) also disagreed that the

information on eye problems due to diabetes should be given by eye doctor only. When asked whether patients with diabetes often waste their time and money in eye checkups as most of the time eyes of diabetics are normal and if the diabetic patient is taking eye treatment they need not worry about controlling their sugar and lipid, more than 90% of the students were correct in their answer. The details of the response on attitude of the nursing students are shown in table 3

Table 3 Showing responses of Attitude questionnaires

Questionnaires	Response				
	Strongly agree N(%)	Agree N (%)	Neutral N (%)	Disagree N (%)	Strongly disagree N (%)
The diabetic patient does not need eye examination if he/she has no symptom	3 (4.8)	0	0	37(59.7)	22(35.5)
The information on eye problems due to diabetes should be given by eye doctor only	7(11.3)	3(4.8)	11(17.7)	31(50.0)	10(16.1)
Patients with diabetes often waste their time and money in eye checkups as most of the time eyes of diabetics are normal	3(4.8)			47(75.8)	12(19.4)
If the diabetic patients are taking eye treatment, they need not worry about controlling their sugar and lipid	3(4.8)		2(3.2)	31(50.0)	26(41.9)
Life style change is very important in preventing the diabetic retinopathy	34(54.8)	23(37.1)	2(3.2)	1(1.6)	2(3.2)

Practice knowledge:

More than eighty percent (84%, N=52) of the subjects did not know the frequency of ocular examination among the diabetic patients and the same was true when they were asked about the implication of laser therapy in diabetic retinopathy patient; 90% of them were of the view that laser treatment restores the vision in most cases of diabetic retinopathy. However more than ninety percent (N=56) of the subjects agreed that Screening of diabetic retinopathy and early intervention can prevent the blindness due to diabetes The details of the answers of the questionnaires on practice are sown in table 4.

Table 4 Showing responses of Practice questionnaires

Questionnaires	Response				
	No.	Percentage			
How frequently should a person with diabetes undergo an eye checkup? Every 6 months Yearly Two yearly Only when vision affected	 52 8 0 2	 83.9 12.9 0 3.2			
Do you know what the treatments available for diabetic retinopathy are? Good control of diabetes alone is adequate Life style medications Laser treatments Surgery All of the above None of the above	 1 0 1 26 34	 1.6 0 1.6 41.9 54.8			

	Strongly agree N(%)	Agree	Neutral	Disagree	Strongly disagree
An eye with diabetic retinopathy if successfully treated with the laser, it does not need laser treatment again	1 (1.6)	11(17.7)	22(35.5)	26(41.9)	2(3.2)
Laser treatment in diabetic retinopathy improves the vision in most of the cases	7(11.3)	34(54.8)	14(22.6)	5(8.1)	2(3.2)
Screening of diabetic retinopathy and early intervention can prevent the blindness due to diabetes	22(35.5)	34(54.8)	2(3.2)	4(6.5)	0

KAP Score:

The knowledge score of thirty seven percent of the nursing students (N=23) was in the excellent range while about 47% (N=29) were in the satisfactory range and only 16% (N=10) were in poor range. The attitude score of more than forty percent (N=25), fifty percent (N=31) and eight percent (N=5) of the nursing students were in the excellent, satisfactory and poor range respectively. The practice knowledge score of thirty two nursing students (N=20) was in the excellent range while 24% (N= 15) and 43% (N=27) were in the satisfactory and poor range respectively. There was no statistically difference in the KAP score of male and female. However the KAP score of nursing students from the urban back ground was significantly better than that of their rural counterpart which was 45% Vs 33% in the excellent score range (p=.003).The mean score of knowledge, practice and attitude were 33.55 ± 1.044, 11.21±0.594 and 22.02 ±0.569 respectively. The practice knowledge score of the female nurse was significantly higher in the satisfactory and excellent range (N=20, 32.26 % vs. N=15, 24.19%, p= .028). The details of the KAP score is presented in table 5 and table 6

Table 5 Showing the KAP scores

	Knowledge Maximum 50 (SD)	Attitude Maximum 25	Practice Maximum 25	Total Maximum 100
Mean Score	30.55(1.04)	22.02(0.59)	11.2(0.569)	66.72 (2.45)
Male	29.2 (1.3)	21.05 (0.44)	8.05 (0.69)	61.3 (0.98)
Female	32.5 (1.22)	22.02(0.59)	11.02 (0.98)	66.54 (1.43)

SD=Standard deviation

Table 6 Showing details of the scores of Knowledge attitude and practice

Variables	Knowledge			Attitude			Practice		
	Excellent range	Satisfactory range	Poor range	Excellent range	Satisfactory range	Poor range	Excellent range	Satisfactory Range	Poor range
Male Female Total	11 (17.75) 12(19.35) 23(37.10)	13 (21) 16(25.80) 29(46.77)	3(4.84) 7(11.29 10(16.13) P=.789	12(19.35) 13(21) 25(40.32)	13(21) 18(29.03) 31 (50)	1(1.61) 4(6.45) 5(8.06) P=.654	9(14.52) 11(17.74) 20(32.26)	6 (9.68) 9(14.51) 15(24.19)	5(8.06) 22(35.48) 27(43.54) P=.028
Rural Urban Total	7 (11.29) 20((32.25) 27 (43.54)	12(19.35) 17 (27.42) 29(46.77)	5(8.06) 1(1.61) 6(9.67) P=.046	10(16.13) 15 (24.19) 25(40.32)	12 (19.35) 19(30.65) 31(50.0)	4(6.45) 2(3.22) 6(9.67) P=0.98	10(16.13) 15(24.19) 25(40.32)	12(19.35) 20(32.26) 32(51.61)	3(4.84) 2(3.22) 5(8.06) P=.230

Discussion:

Baseline information achieved from KAP study on diabetic ocular complications is an important source of information for assisting in strengthening the policies for prevention of blindness program. The nursing students who are the future practicing nursing staffs will play pivotal role in primary prevention of any disease including diabetic eye disease. Their core knowledge, attitude and correct practice knowledge towards the prevention and control of the disease play a crucial role. Nursing schools tend to have rigorous programs and students are expected to complete the clinical portions simultaneously,

Our study revealed that among the nursing students of final year of King Faisal University, some crucial knowledge and practice knowledge information regarding diabetic ocular condition was lacking. Our study showed that fifty percent of the participants did not hear about the diabetic eye diseases. In contrast, the satisfactory level of attitude was noted in very high proportions of participants. This is in accordance with a study conducted in India where attitude of the nurses were not only satisfactory but was as par with the medical students [28].A study conducted on the medical nurses in Switzerland has also found mediocre level knowledge among them about diabetes and its complications [29].Studies conducted in Oman [14], Egypt [30] and South Africa [31] has revealed less conceived knowledge of the nurses working at primary health care centers. Testing the perceived knowledge, attitude and practice knowledge of nursing students who are the future workforce of primary health care is an important measure for planning suitable courses for them.

A positive attitude of the nurses is one of the important factors for the successful patient education on prevention of complication of any disease including diabetes. Research shows that if nurses perceive\e themselves as educators in patient teaching, they are more likely to be committed to teach patients and family members [32].We found an acceptable level of attitude of the final year nursing students towards diabetic ocular patients. In a similar study conducted in India, the researchers have found a positive attitude of the nurses towards the diabetic patients which improved with the age of the nurses (mean age of 22.9 ± 3.3 year) .In our research the mean age of the nursing students was 27.10± 5.12).

The total mean KAP score of more than sixty six percent (SD=+-2.45) in our study is better than those documented in other studies conducted in Oman, India and Egypt [14.28.30].

We did not find many studies on KAP on nursing students for more comparison.

However, the outcomes of this study is useful in enhancing Saudi‘s approach to diabetes ocular diseases education for nursing students during their study period.

Limitation of the study: We included only final year student of the nursing school due to the fact that the clinical teaching and practicum is done mainly in the final of the nursing study curriculum. This caused the small study population. However the result of this study has given a valuable insight which will help the nursing college to incorporate the suitable subject to increase the knowledge, attitude and practice towards the management of diabetic ocular diseases. Similar type of research is needed to include other nursing college students to get more generalized result.

Conclusion and recommendation: Since the nurses in practice play a crucial role in the prevention of various diseases, this survey identified the need for improvement in their knowledge, attitude and practices for preventing and treating the patients with diabetic ocular diseases. They should acquire knowledge and develop proper attitude and practice while still in education. This should be made

mandatory in their education curriculum. This can be done by incorporating special syllabus focusing on diabetic ocular diseases in their teaching programme.

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